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XI/SCIENCE/ 2017-18

OLYMPIAD PRACTICE WORKSHEET

Tick the correct option

1. Which is not consistent with double helical structure of DNA?
 - (a) $A = T, C = G$
 - (b) density of DNA decreases on heating
 - (c) $A + T/C + G$ is not constant
 - (d) both a and b.
2. A nucleotide is formed of
 - (a) purine, pyrimidine and phosphate
 - (b) purine, sugar and phosphate
 - (c) nitrogen base, sugar and phosphate
 - (d) pyrimidine, sugar and phosphate.
3. Mineral associated with cytochrome is
 - (a) Cu
 - (b) Mg
 - (c) Cu and Mg
 - (d) Fe.
4. The basic unit of nucleic acid is
 - (a) pentose sugar
 - (b) nucleoid
 - (c) nucleoside
 - (d) nucleotide.
5. DNA is composed of repeating units of
 - (a) ribonucleosides

- (b) deoxyribonucleosides
 - (c) ribonucleotides
 - (d) deoxyribonucleotides
6. A nucleotide is formed of 95% water. Water present
- (a) Purine, pyrimidine and phosphate
 - (b) Purine, sugar and phosphate
 - (c) Nitrogen base, sugar and phosphate
 - (d) Pyrimidine, sugar and phosphate.
7. Living cell contains 60 – in human body is
- (a) 60 – 65%
 - (b) 50 – 55%
 - (c) 75 – 80%
 - (d) 65 – 70%.
8. Amino acids are produced from
- (a) proteins
 - (b) fatty acids
 - (c) essential oils
 - (d) a-keto acids.
9. In which of the following substances will hydrogen bond be strongest?
- (a) HCl
 - (b) H₂O
 - (c) HI
 - (d) H₂S
10. The bond between B and C will be
- (a) Ionic

- (b) Covalent
- (c) Hydrogen
- (d) Coordinate

11. Which of the following statement is not correct from the view point of molecular orbital theory?

- (a) Be₂ is not a stable molecule.
- (b) He₂ is not stable but He₂⁺ is expected to exist.
- (c) Bond strength of N₂ is maximum amongst the homonuclear diatomic molecules belonging to the second period.
- (d) The order of energies of molecular orbitals in N₂ molecule is $\sigma_{2s} < \sigma^*_{2s} < \sigma_{2pz} < (\pi_{2px} = \pi_{2py}) < (\pi^*_{2px} = \pi^*_{2py}) < \sigma^*_{2pz}$

12. The electronic configuration of the outer most shell of the most electronegative element is

- (a) 2s²2p⁵
- (b) 3s²3p⁵
- (c) 4s²4p⁵
- (d) 5s²5p⁵

13. . Which of the following angle corresponds to sp² hybridisation?

- (a) 90°
- (b) 120°
- (c) 180°
- (d) 109°

14. In which of the following molecule/ion all the bonds are not equal?

- (a) XeF₄
- (b) BF₄⁻

(c) C₂H₄

(d) SiF₄

15. A spring gun has a force constant 1000 N/m. When a ball of 10 gm is shot from this gun, its spring is compressed by 10 cm. Find the maximum horizontal distance that can be achieved by the ball : ($g = 10 \text{ m/s}^2$)

(a) 20 m

(b) 25 m

(c) 50 m

(d) 100 m

16. The work done by the push of air on an object of mass 10 kg falling from rest through a vertical distance of 10 m is 500 J. Find the velocity of the object at the end of 10 m fall: ($g = 10 \text{ m/s}^2$)

(a) 20 m/s

(b) 12 m/s

(c) 5 m/s

(d) 10 m/s

17. A bullet of mass 10 g leaves a rifle at an initial velocity of 1000 m/s and strikes earth at the same level with a velocity of 500 m/s. the work in overcoming the resistance of air will be:

(a) 500 J

(b) 5000 J

(c) 3750 J

(d) 475 J

18. A 15 g ball is shot from a spring gun whose spring has a force constant of 600 N/m. The spring is compressed by 5 cm. the greatest possible horizontal range of the ball for this compression is : ($g = 10 \text{ m/s}^2$)

- (a) 6.0 m
- (b) 10.0 m
- (c) 12.0 m
- (d) 8.0 m

19. A steel ball of mass 5 g is thrown downward with velocity 10 m/s from height 19.5m. It penetrates sand by 50 cm. The change in mechanical energy will be: ($g = 10 \text{ m/s}^2$)

- (a) 1 J
- (b) 1.25 J
- (c) 1.5 J
- (d) 1.75 J

20. A ball of mass 4 kg moving with velocity 3 m/s, collides with spring of natural length 2 m and force constant 144 N/m. What will be length of compressed spring?

- (a) 2 m
- (b) 1.5 m
- (c) 1 m
- (d) 0.5 m